Common SAW problems – Causes & Remedies

1.0 COMMON WELDING DEFECTS OBSERVED IN SAW PROCESS:

The process variables, materials or welding procedures can affect the weld quality. Some of the commonly observed defects in SAW welding and their possible remedies are tabulated below.

	Possible Causes	***Corrective Actions***
	Weld metal cracks	
1.	Too high a weld depth-to-width ratio.	• Increase the arc voltage or decrease the welding current.
2.	Too small a weld bead.	• Decrease the travel speed.
3.	Rapid cooling of the crater at the end of the weld.	• Fill craters adequately. • Hold the arc for few seconds by stopping the trolley movement before stop of the welding.
	Inclusions	
1.	Use of multiple pass, short circuiting type welding (slag).	• Clean the previous bead before making subsequent passes.
2.	High travel speeds (film type inclusions).	• Reduce the travel speed. • Increase the arc voltage.
	Porosity	
1.	Inadequate re-drying of flux or long time exposure to open air after re-drying of the flux.	• Re-dry the flux as recommended by the manufacturer. • In case of open air exposure or over-night exposure, ensure flux is dried again before use. • Reduce the travel speed. • Reduce the arc gap. • Hold the gun till the molten crater solidifies.
2.	Electrode contamination.	• Use clean and dry electrodes. • Eliminate contamination of electrode wire with any lubricant.
3.	Work-piece contamination.	• Remove oil, grease, rust, paints and dusts from the work surface prior to welding.
4.	Suitability of the flux	• Flux type varies with speed of welding or its characteristics to operate at higher current

		& AC/DC polarity. Follow the manufacturer recommendation.

Incomplete fusion

1.	Work-piece surface not clean.	• Clean all groove surfaces and weld zones.
2.	Insufficient heat input.	• Increase the electrode feed rate and the arc voltage. • Decrease the travel speed.
3.	Improper welding technique.	• Set the wire properly in the position in a multi-layer weld deposit.
4.	Improper joint design.	• Select proper groove design. • Maintain a proper groove angle to provide an easy access to electrode extension.

Lack of penetration

1.	Improper joint preparation.	• Provide/Increase root openings in butt-joint. • Decrease the height of root face.
2.	Improper welding technique.	• Set the wire position based on the bead profile of the previous bead.
3.	Inadequate heat input.	• Increase the wires feed rate, voltage and/ or reduce travel speed.

Excessive melt through

1.	Excessive heat input.	• Reduce the electrode feed rate & volt. • Increase the travel speed.
2.	Improper joint preparation.	• Reduce excessive root opening. • Increase the height of the root face.